plate 40 and the injector 22, the remote plasma CVD apparatus illustrated in Fig. 6 comprises a plate 42 serving as a SiH_4 gas distribution structure. The plate 42 comprises a top portion 45, a bottom portion 46, a plurality of tube walls 47, and a plurality of gas injection holes 43, and defines a gas supplier plenum 44. The gas supplier plenum 44 makes the silane gas uniform in a plane, thereby resulting in uniformity in the distributed silane gas. The top portion 45 has a plurality of upper holes, while the bottom portion 46 has a plurality of lower holes. The tube walls 47 connect between the upper holes and the lower holes, respectively, and form perforated holes 41 which are separated or isolated from the gas supplier plenum 44.--

A3 Cont

REMARKS

The specification has been amended to correct minor typographical errors.

Pursuant to 37 CFR 1.121, a marked copy of the specification paragraphs showing changes made therein accompanies this Amendment. No new matter has been entered.

Turning first to the restriction and election requirements, Applicants affirm their provisional election of Invention I and of Species IV, Figure 6, and claims 1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 40, 41, 43, 44 and 46, which are believed readable thereon. It is requested that the remaining claims be held in this Application, without further action thereon, for rejoinder and/or for filing of a divisional application.

Turning to the rejection of claims 1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 40, 41, 43, 44 and 46 under 35 USC § 112, Applicants frankly do not understand what is bothering the Examiner. Applicants' specification provides specific working examples of what is meant by "aperture ratio" (see the paragraph bridging pages 7-8;

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the paragraph bridging pages 8-9; the last full paragraph on page 9; and the last full paragraph on page 12 of the specification). For example, according to the description on page 7, line 23, a plate has a size of 400mm x 500mm and therefore plane area of 200,000mm^2 while perforated holes are equal in number to 100 and each perforated hole has a diameter of 11mm. The whole area of the 100 perforated holes can be readily calculated by (TYr^2) x 100 (namely, 3.14 x 5.5^2 x 100) and becomes equal to 9498.5mm^2. Thus, the aperture ratio in question is given by 9498.5/200,000 and is equal to 0.0474925. Therefore, the aperture ratio in the illustrated example is smaller than 5%, as mentioned in the above-referenced paragraph. The present inventors have found that an aperture ratio not greater than 5% is effective to cause silane gas to flow back into a plasma generation region 12 (see page 8, lines 10 to 12 of the instant specification).

Moreover, the term "aperture ratio" is used in its conventional meaning. The Merriam-Webster Collegiate Dictionary defines the term "aperture" as "an opening, an open space, or a hole." The term "ratio" is defined by the Merriam-Webster Collegiate Dictionary as "the relationship in quantity, amount, or size between two or more things or a proportion." Using these definitions and the specific working examples, the plain meaning of "aperture ratio of the perforated holes to the plate" is the relationship in cross-sectional area between the perforated holes and the plate. Since terms in the claims must be given their plain meaning, and the plain meaning of the terms is set forth above, the Examiner's rejection of claims 1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 40, 41, 43, 44 and 46 under 35 USC § 112 is in error, and reconsideration and withdrawal thereof is respectfully requested.

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Turning to the rejection of claims 1, 2, 4, 11, 13, 14, 16, 23, 25, 26, 28, 35, 37, 38 and 40 under 35 USC § 102 as anticipated by Japanese Patent Publication 11-168094 by Yuda, Yuda does not anticipate Applicants' claimed invention since Yuda discloses neither a flow back phenomenon of silane gas into a plasma generation region nor prevention of such a flow back phenomenon. Accordingly, no consideration is made at all in Yuda about an aperture ratio mentioned above. Yuda merely teaches the injection of an inert gas and SiH_4 into a middle mesh plate electrode (paragraph 43, Figures 8 and 10).

All of Applicants' independent claims 1, 2, 11, 14, 23, 26, 35 and 38 require, respectively, a first inlet communicating with the plasma generation region to introduce a first gas into the plasma generation region, and a second inlet communicating with the processing region to supply a second gas into the processing region. Yuda does not teach this. Rather, Yuda combines and introduces his two gases directly in a processing region. Thus, Yuda cannot be said to anticipate any of the independent claims, 1, 2, 11, 14, 23, 26, 35 or 38 of Applicants' claims, or the several claims 4, 13, 16, 25, 28, 37 and 40 dependent thereon.

Turning to the rejection of claims 5, 7, 8, 10, 17, 19, 20, 22, 29, 31, 32, 34, 41, 43 and 44, and 46 as obvious from Yuda in view of Sameshima et al., each of said claims, directly or through dependency, like the claims above discussed, require a first inlet communicating with the plasma generation region to introduce a first gas into the plasma generation region, and a second inlet communicating with the processing region to supply a second gas into the processing region. As noted supra, Yuda does not teach this. The secondary reference, Sameshima et al., does not supply this missing teaching. Sameshima et al. teaches a CVD apparatus with a plurality of gas inlets to a mesh plate (col. 4, lines 25-43 and Figure 1).

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However, Sameshima et al. also fails to teach or suggest an aperture ratio of a disk shaped mesh plate. Thus, Sameshima et al., like Yuda, also fails to teach separate gas inlets communicating, respectively, with the plasma generation region and the processing region as required by Applicants' claims. Thus, no combination of Yuda and Sameshima et al. reasonably could achieve any of independent claims 5, 8, 17, 20, 29, 32, 41 and 43, or any of the claims 7, 10, 19, 22, 31, 34 and 46 dependent therefrom.

Having dealt with all the objections raised by the Examiner, the Application is believed to be in order for allowance.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231 on November 14, 2002, at Tucson, Arizona.

By Diana Carr

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SERIAL NO. 09/820,149

DOCKET NO. NEC WNZ-2310

MARKED SPECIFICATION PARAGRAPHS SHOWING CHANGES MADE

Paragraph bridging pages 1 and 2, beginning at page 1, line 17:

In an exemplary remote plasma CVD process, two types of gases are used. One type of [gases] gas is a plasma material gas that is decomposed, and/or energized, and changed into plasma including radicals and excited species, while another type of [gases] gas is a deposition material gas that reacts with the radicals and excited species in a gas phase reaction. For example, the former is oxygen (O_2) gas while the latter is monosilane or silane (SiH_4) gas. In a remote plasma CVD process, oxygen gas is at first energized and changed into plasma within a plasma generation region. The plasma includes excited species and radicals which are excited oxygen atoms, excited oxygen molecules, oxygen atoms, oxygen molecules, and ozone molecules. The radicals and excited species included in the plasma are supplied into a substrate processing region that is separated or isolated from the plasma generation region. Independently of the excited species and radicals, monosilane gas is also supplied into the substrate processing region, where a gas phase reaction between the oxygen gas and the monosilane gas occurs. The gas phase reaction produces precursors which are for silicon dioxide (SiO_2) and are for example SiH_x, SiH_xO_y, SiO_y, and so on. The precursors are adhered to a substrate or a wafer arranged within the substrate processing region and are subjected to oxidation, thermal dissociation and so forth, so that the silicon dioxide film are formed on the substrate or the wafer. Silicon nitride (Si_3N_4) film and an amorphous silicon (a-Si) film can be formed in the way similar to the above-mentioned remote plasma CVD process.

Paragraph beginning at page 3, line 18:

The plate is arranged between the plasma generation region and the processing region and is formed with a plurality of perforated holes through which the radicals pass. The plate is designed such that aperture ratio of the perforated holes to the plate is not greater than five percent. Each perforated hole may have a diameter not larger than three [millimeter] <u>millimeters</u>.

Paragraph bridging pages 12 and 13, beginning at page 12, line 28:

Referring to Figs. 6 through 9, a remote plasma CVD apparatus according to another embodiment of the present invention comprises the similar structure of the remote plasma CVD apparatus depicted in Fig. 5 except for an injection mechanism of the silane gas. Instead of the plate 40 and the injector 22, the remote plasma CVD apparatus illustrated in Fig. 6 comprises a plate 42 serving as a SiH_4 gas distribution structure. The plate 42 comprises a top portion 45, a bottom portion 46, a plurality of tube walls 47, and a plurality of gas injection holes 43, and defines a gas supplier plenum 44. The gas supplier plenum 44 makes the silane gas uniform in a [plain] <u>plane</u>, thereby resulting in uniformity in the distributed silane gas. The top portion 45 has a plurality of upper holes, while the bottom portion 46 has a plurality of lower holes. The tube walls 47 connect between the upper holes and the lower holes, respectively, and form [the] perforated holes 41 [that is] <u>which are</u> separated or isolated from the gas supplier plenum 44.